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Insoluble, only slightly swellable popcorn polymer, used e.g. as ion exchange or adsorber resin or filter aid, is obtained by polymerisation of styrene, N-vinyl-lactam or N-vinyl-amine and difunctional crosslinker

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Addnl. Data: ERNST A, MEFFERT H, SANNER A, STEIN S,
RUCHATZ F

NOVELTY

Insoluble, only slightly swellable popcorn polymers contains (a) 50-99 wt% styrene and/or mono-unsaturated styrene derivative(s), (b) 0.1-40 wt% N-vinyl-lactam(s) or N-vinyl-amine(s) and (c) 0.1-10 wt% difunctional crosslinker(s).

DETAILED DESCRIPTION

An INDEPENDENT CLAIM is also included for a process for the production of these polymers by polymerisation of the above monomers in the absence of oxygen and polymerisation initiators.

USE

Used as ion exchange resins, adsorber resins and filtration aids (claimed).

ADVANTAGE

Insoluble, only slightly swellable, chemically inert popcorn polymers with a large surface area, obtained in a largely solvent-free state by a simple, low-cost process with an acceptable reaction time.

EXAMPLE

A mixture of 450 g water, 50 g N-vinylpyrrolidone, 1 g N,N'-divinylethylene-urea (DVEU) and 0.05 g sodium hydroxide was heated to 60°C under nitrogen, treated with a solution of 0.1 g sodium dithionite in 10 g water, heated at 80°C for 20 minutes, treated over 4 hours with a solution of 3 g DVEU in 150 g styrene, diluted over 2 hours with 1000 ml water and heated for a further 1 hour at 80°C. The viscous suspension was worked up by filtration, washing with water (to remove soluble polymer and monomers) and drying under vacuum, to give a popcorn polymer in a yield of 96%.

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TECHNOLOGY FOCUS

Polymers - Preferred Composition: Polymers containing (a) 70-99 (preferably 75-97) wt% styrene, (b) 0.5-30 wt% N-vinylpyrrolidone (NVP), N-vinyl-piperidone, N-vinylcaprolactam, optionally methylated N-vinylimidazole and/or N-vinylformamide, preferably 1-25 wt% NVP, (c) 0.1-8 wt% N,N'-divinylethylene-urea (DVEU), N,N'-divinylpropylene-urea and/or divinylbenzene (DVB), preferably 0.2-5 wt% DVEU and/or DVB, and possibly (d) 0-20 wt% other radically polymerizable monomers. Preferred Process: Polymerisation is carried out at 20-200°C.
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